DFW RCE 742

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Request for Continued Examination (RCE) Transmittal

Address to:
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Alexandria, VA 22313-1450

Application Number	09/937,889
Filing Date	October 2, 2001
First Named Inventor	Akio Tosaka
Art Unit	1742
Examiner Name	Sikyin IP
Attorney Docket Number	1307-01

This is a Request for Continued Examination (RCE) under 37 CFR 1.114 of the above-identified application.
Request for Continued Examination (RCE) practice under 37 CFR 1.114 does not apply to any utility or plant application filed prior to June 8, 1995, or to any design application. See Instruction Sheet for RCEs (not to be submitted to the USPTO) on page 2.

1. Submission required under 37 CFR 1.114 Note: If the RCE is proper, any previously filed unentered amendments and amendments enclosed with the RCE will be entered in the order in which they were filed unless applicant instructs otherwise. If applicant does not wish to have any previously filed unentered amendment(s) entered, applicant must request non-entry of such amendment(s).

   a. [x] Previously submitted. If a final Office action is outstanding, any amendments filed after the final Office action may be considered as a submission even if this box is not checked.

      i. [ ] Consider the arguments in the Appeal Brief or Rely Brief previously filed on _____

      ii. [x] Other Please enter the Amendment filed on July 9, 2004

   b. [x] Enclosed

      i. [x] Amendment/Reply

      ii. [ ] Affidavit(s)/ Declaration(s)

      iii. [ ] Information Disclosure Statement (IDS)

      iv. [x] Other Claim of Extension, in duplicate

2. Miscellaneous

   a. [ ] Suspension of action on the above-identified application is requested under 37 CFR 1.103(c) for a period of _____ months. (Period of suspension shall not exceed 3 months; Fee under 37 CFR 1.17(i) required)

   b. [ ] Other _____

3. Fees The RCE fee under 37 CFR 1.17(e) is required by 37 CFR 1.114 when the RCE is filed.

   a. [x] The Director is hereby authorized to charge the following fees, or credit any overpayments, to Deposit Account No. 50-2719

      i. [ ] RCE fee required under 37 CFR 1.17(e)

      ii. [ ] Extension of time fee (37 CFR 1.136 and 1.17)

      iii. [x] Other any deficiencies

   b. [x] Check in the amount of $ $770.00;$420.00 enclosed

   c. [ ] Payment by credit card (Form PTO-2038 enclosed)

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT REQUIRED

Name (Print/Type)	T. Daniel Christenbury	*Registration No. (Attorney/Agent)*	31,750
Signature		*Date*	September 10, 2004

CERTIFICATE OF MAILING OR TRANSMISSION

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Mail Stop RCE, Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450 or facsimile transmitted to the U.S. Patent and Trademark Office on the date shown below.

Name (Print/Type)	T. Daniel Christenbury		
Signature		Date	September 10, 2004

This collection of information is required by 37 CFR 1.114. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Mail Stop RCE, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Art Unit	: 1742	**Customer No.: 035811**
Examiner	: Sikyin Ip	
Serial No.	: 09/937,889	
Filed	: October 2, 2001	
Inventors	: Akio Tosaka	Docket No.: 1307-01
	: Sinjiro Kaneko	
	: Yoichi Tominaga	Confirmation No.: 8803
	: Noriyuki Katayama	
	: Nobutaka Kurosawa	
	: Kei Sakata	
	: Osamu Furukimi	
Title	: HIGH TENSILE HOT-ROLLED STEEL SHEET	
	: HAVING EXCELLENT STRAIN AGING	
	: HARDENING PROPERTIES AND METHOD	
	: FOR PRODUCING THE SAME	
		Dated: September 10, 2004

SUPPLEMENTAL RESPONSE

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Supplemental to the Amendment filed July 9, 2004, this paper is further responsive to the Official Action dated April 13, 2004 in view of the helpful comments included in the Advisory Action of July 27, 2004.

With reference to the 35 USC § 103 rejection set forth in the Official Action, the July 27 Advisory Action indicates that the claimed range of less than 0.02% Al content would have been obvious over the range of 0.02-0.10% Al disclosed in Maid, absent evidence that the difference is critical. In addition to the reasons for non-obviousness set forth in the July 9 Amendment, the Applicants respectfully contend that the Al content of less than 0.02%, in combination with other claimed elements, is indeed important to achieving steel having properties that are neither described

nor suggested by the prior art. One novel property of the invention is an increase in tensile strength (ΔTS) over the prior art. The importance of ΔTS is discussed below.

The steel sheet of the invention becomes hard after press forming due to strain age hardening occurring in the paint baking step and the hardness contributes to improvements in impact and fatigue resistance. Strain age hardening referred to herein means not only an increase in YP, yield point, (=BH) but also an increase in TS, tensile strength (=ΔTS). To increase impact and fatigue resistance, an increase in only YP is insufficient. An increase in TS is also necessary. The increase in YP only improves elastic deformation strength, whereas plastic deformation strength is not improved. The increase in TS improves plastic deformation strength. An increase in TS is a new function of a steel sheet which has never been secured.

By way of further explanation, the Applicants submit herewith Exhibit 1, which is a graph of stress-strain curves for a conventional steel alloy (in gray, starting near the origin), an alloy having increased yield point, BH, only (in black, starting to the right of the origin adjacent the 2% label), and an alloy in accordance with aspects of the invention, which shows an increase in yield point and an increase in tensile strength, ΔTS (in black, starting to the right of the 2% label).

Exhibit 1 shows that the steel having high BH only exhibits high deformation resistance in the elastic deformation. It is true that high BH steel is strong in the usual use, such as when pushed by hand in elastic deformation range. On the other hand, the steel having high ΔTS exhibits high deformation resistance both in elastic and plastic deformation. The ΔTS is important, for example, when a car is involved in an automobile collision, which involves plastic deformation. The car made of high ΔTS steel will not readily deform in a collision. On the other hand, the car made of high BH steel only can easily deform in a collision.

Both Maid and Tosaka describe steel sheets having BH, but not ΔTS. Thus, the ΔTS

represents an important difference between the steel of the invention and that of the prior art.

In order to achieve the Applicants' ΔTS, the combination of all of the following elements of the invention should be totally satisfied:

(1) Al content of less than 0.02%,

(2) N content of 0.0050 to 0.0250%,

(3) N/Al is 0.3 or more,

(4) N in a solid solution state is 0.0010% or more, and

(5) average crystal grain size is 10 μm or less.

The Applicants respectfully submit that that the prior art of record provides no suggestion to provide steel having such a ΔTS. In addition, the prior art fails to teach or suggest several of the elements necessary to achieve ΔTS, and certainly does not describe or suggest them in the claimed combination. As explained in the July 9 Amendment and acknowledged by the Examiner, Maid does not describe an Al content of less than 0.02%. The Examiner has also acknowledged that Maid does not disclose the claimed N/Al ratio of 0.3 or more, the amount of N in a solid solution and the ferrite grain size of 10μm or less. Tosaka does not disclose N content, solid solution N content or the N/Al ratio. In addition, even if combined, the references fail to suggest, among other things, the claimed average crystal grain size. Thus, even when combined, the references are collectively non-enabling. This alone compels allowance of the claims.

The Advisory Action indicates that the many examples of grain size in Tosaka, which fall outside of the claimed range, are not limiting of Tosaka and, therefore, that Tosaka does not exclude grain sizes of less than 10 μm. Nonetheless, Tosaka must teach or suggest the other grain size, which it does not. In any event, the mere fact that the claimed grain size range is not excluded from the scope of Tosaka does not render the claimed range obvious. A fair reading of Tosaka clearly reveals

that Tosaka contemplates the use of grain sizes between 11 and 20 μm. Tosaka simply provides no suggestion to specifically use a grain size less than 10 μm, let alone to do so in the claimed combination or to do so to achieve steel with the Applicants' ΔTS. Because there is no suggestion to limit the average grain size to 10 μm or less, which, in combination with the claim elements noted above, is important for achieving steel having the Applicants' ΔTS, the claimed range would not have been obvious even if Maid and Tosaka were combined.

However, the Examiner's attention is also again drawn to the July 9 Amendment for the discussion regarding the propriety of making the hypothetical combination --- one skilled in the art would not find any suggestion in the art or otherwise be motivated to combine the cold-rolled steel sheet of Tosaka with the hot-rolled steel sheet of Maid. Absent that combination, Tosaka fails to describe or suggest several elements of the combination necessary to achieve steel having the Applicants' ΔTS.

With respect to the content of dissolved N, the Advisory Action notes that both dissolved and precipitated forms of N are well known, and indicates that it is unclear why dissolved N could not be measured. The Applicants do not contend that dissolved N cannot be measured. Instead, the Applicants respectfully submit that the dissolved N content of Maid is not apparent from a fair reading of the reference. Based on the disclosure of Maid, the N content could be in any form (*e.g.*, dissolved or precipitated). Therefore, it is unknown whether or not the N content is, in fact, dissolved. It is well settled that, for a claimed characteristic to be inherently present, the characteristic must necessarily be present. In the case of Maid, where the N content could be in any form, it is clear that the N content is not necessarily in a dissolved state. Thus, N in a solid solution state of 0.0010% or more cannot be said to be inherently present in Maid.

Also in this regard, the Examiner's attention is again directed to the July 9 Amendment for

an explanation of several factors, such as processing steps and other alloying metals, especially Al, that influence whether N content will be in one form or another. The variability of these factors introduces a wide range of possibilities for the amount of dissolved N that is potentially present. Moreover, according to the actual experimental results in Maid, the N content is 0.006%, the Al content is 0.025% and the N/Al ratio is 0.24 (Table 1). These values do not satisfy the conditions relating to Al content (0.02% or less) or the N/Al ratio (0.3 or more), which achieve the invention. Al has an operation of combining with N and reducing the content of solid solution N and said operation is conspicuous in proportion to the increase of Al content. In light of these factors, it cannot be said that Maid inherently describes or suggests any particular range for dissolved N content, and certainly does not suggest the claimed content of N in a solid solution state of 0.0010% or more.

The Advisory Action also indicates that the claimed ratio of N/Al of 0.3 is overlapped by the ranges set forth in the abstract of Maid, which include an N content of 0.011% or less and an Al content of from 0.02 to 0.10%. One could arrive at the claimed ratio only by using specific values of N and Al contents within these ranges. Most values of N and Al contents selected from the disclosed Maid ranges would not satisfy the ratio. For example, if the Maid N content is set at its maximum value of 0.011%, the Al content must be established between 0.02% and 0.037% to satisfy the ratio. The suitable Al content range only decreases as the N content is decreased from its maximum, until the N content reaches 0.006%, below which no values of Al between 0.02% and 0.10% would satisfy the ratio. Thus, possible contents of N and Al that would satisfy the claimed ratio are limited to a small portion of the possible N and Al contents contemplated by Maid. In fact, as noted above, the examples set forth in Maid Table 1 (N = 0.006, Al = 0.025) establish a ratio of 0.24, which fails to satisfy the claimed ratio range. There is no suggestion in Maid, the other

references of record or in the knowledge of one skilled in the art that would have rendered the claimed ratio range obvious at the time the invention was made. Moreover, the claimed range is important to achieve steel having ΔTS. Because the claimed ratio range is not described or suggested in the prior art, and because the claimed range is one of the factors that imparts the novel property of ΔTS, which itself is not suggested in the art, the claims are patentable over Maid, whether or not in combination with Tosaka.

In conclusion, the elements of (1) Al content of less than 0.02%, (2) N content of 0.0050 to 0.0250%, (3) N/Al of 0.3 or more, (4) N in a solid solution state of 0.0010% or more, and (5) average crystal grain size of 10 μm or less are all important to achieve the steel of the invention. For the reasons set forth above, several of these elements, even when considered individually, are not described or suggested in the references of record. Clearly, the use of the claimed elements in combination with one another is certainly not disclosed or suggested. It is only through the combination, as it is specifically claimed, that one can achieve steel having the Applicants' ΔTS.

Reconsideration and withdrawal of the rejections based on the hypothetical combination of Maid and Tosaka is respectfully requested. In light of the foregoing, the Applicants respectfully submit that the entire Application is now in condition for allowance, which is respectfully requested.

Respectfully submitted,

T. Daniel Christenbury
Reg. No. 31,750
Attorney for Applicant(s)

TDC:pam
(215) 656-3381

EXHIBIT 1